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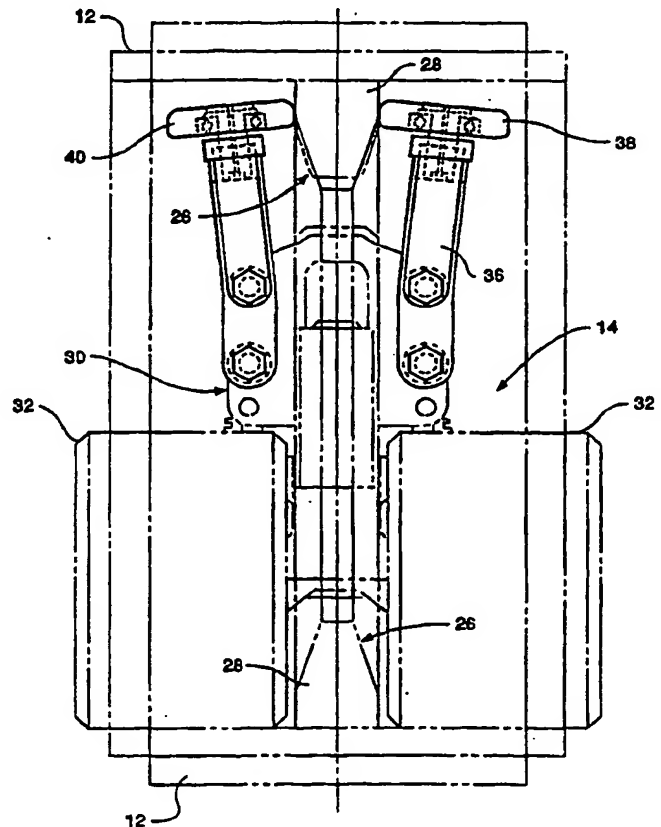
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(54) Title: RESILIENT WHEELS WITH REINFORCING RINGS

(57) Abstract

A belted undercarriage assembly (14) for a belt laying track machine includes a frame (30), an endless belt (12) for supporting the machine, a plurality of spaced apart resilient wheels (16, 18) in contact with the belt (12), and a plurality of guide members (26) associated with the belt (12). Each of the resilient wheels (16, 18) includes a sidewall portion (22, 24) having a reinforcing ring (20) attached thereto. The reinforcing rings (20) are adapted to contact the guide members (26) and prolong the useful life of the resilient wheels (16, 18). The reinforcing rings (20) are preferably segmented to provide a plurality of spaced apart pads (42) having substantially straight edge portions (44, 46) for removing debris from the frame (30) as the resilient wheels (16, 18) rotate.



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DescriptionRESILIENT WHEELS WITH REINFORCING RINGS5     Technical Field

          This invention relates generally to resilient wheels and more particularly to resilient wheels for supporting an endless belt of a belted undercarriage assembly. The resilient wheels include reinforcing rings which are adapted to contact guide portions of the endless belt to prolong the wear life of the resilient wheels.

Background Art

15           One type of work machine suitable for use on wet, muddy, and sandy soils is one having an undercarriage incorporating an endless flexible drive belt and associated support rollers and idler wheels. This type of belted undercarriage is now widely used on both powered and non-powered machines. Each wheel assembly includes a pair of spaced apart tires or rubber coated wheels which form an opening therebetween. The flexible belt includes a plurality of integrally formed resilient guide blocks which pass through the opening to guide the flexible belt.

20           Continuous frictional contact between the guide blocks and the idler wheels can cause damage to the idler wheels and the guide blocks. To prevent such frictional contact and damage, it is important that proper alignment between the guide blocks and the idler wheels be maintained. However, even when good alignment is maintained, some contact will occur between the guide blocks and the idler wheels.

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The present invention is directed to overcoming one or more of the problems as set forth above.

5     Disclosure of the Invention.

          In one aspect of the present invention, apparatus for supporting and guiding an elastomeric drive belt of a belted undercarriage assembly includes a resilient wheel having first and second spaced apart  
10     side wall portions with the resilient wheel being adapted to contact the drive belt. The resilient wheel is further adapted to be mounted to the undercarriage assembly adjacent the guiding portion and includes a reinforcing ring connected to one of  
15     the side wall portions.

          The subject invention provides structure which prolongs the useful life of the resilient idler wheels and other undercarriage components. This is accomplished by providing reinforcing rings on the  
20     resilient idler wheels.

Brief Description of the Drawings

          Fig. 1 is a diagrammatic side elevational view of a portion of a belted undercarriage assembly incorporating the subject invention;  
25     

          Fig. 2 is a diagrammatic front elevational view, on an enlarged scale, taken generally along the lines 2-2 of Fig. 1;

          Fig. 3 is a diagrammatic sectional view taken generally along the lines 3-3 of Fig. 1;  
30     

          Fig. 4 is a diagrammatic sectional view, on an enlarged scale, taken generally along the lines 4-4 of Fig. 1; and

Fig. 5 is a diagrammatic sectional view, on an enlarged scale, taken generally along the lines 5-5 of Fig. 1.

5     Best Mode for Carrying Out the Invention

Referring to the drawings, an apparatus 10 for supporting and guiding an endless elastomeric drive belt 12 of a belted undercarriage assembly 14 includes first and second resilient idler wheels 16,18 and resilient reinforcing rings 20 which are connected to the resilient wheels 16,18. Each of the wheels 16,18 has first and second side wall portions 22,24 and a resilient reinforcing ring 20 is preferably connected to each side wall portion 22,24. The drive belt 12 has a guiding portion 26 which includes a plurality of spaced guide blocks 28. The idler wheels 16,18 are mounted to the undercarriage assembly 14 and are adapted to contact the drive belt 12 adjacent the guide blocks 28. The undercarriage assembly 14 includes a frame structure 30 which supports the idler wheels 16,18 and a plurality of guide wheels 32. The idler wheels 16,18 are spaced apart to define an opening 34 therebetween to accommodate the guide blocks 28.

25             The undercarriage assembly 14 further includes a bracket 36 connected to the frame structure 30 and first and second spaced apart guide rollers 38,40 rotatably connected to the bracket 36. The guide rollers 38,40 are positioned adjacent the guide blocks 28 and the resilient wheels 16,18, and are adapted to contact the guide blocks 28 and guide them into the opening 34.

Each of the reinforcing rings 20 is preferably segmented and includes a plurality of substantially similar spaced pads 42. The pads 42 are

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bonded to the side wall portions 22,24 of each wheel 16,18 and each pad 42 includes first and second edge portions 44,46. Each edge portion 44,46 is straight and substantially normal to the side wall portion 22,24 to which the pad 42 is bonded. Each pad 42 also includes inner and outer edge portions 48,50 having respective first and second arc length 52,54. Preferably, the first and second arc lengths 52,54 are substantially equal, whereby adjacent pads 42 define a wedge shaped space 56 therebetween. The space 56 has an inner dimension "a" and an outer dimension "b", with "a" being less than "b". The inner and outer edge portions 48,50 are connected to the side wall portions 22,24 by a radius 58.

The first and second straight edge portions 44,46 serve to remove mud and debris from the undercarriage assembly 14, especially the frame structure 30, as the idler wheels rotate. This mud and debris is ejected outwardly of the pads 42 because of the larger outer dimension "b" of the space 56.

#### Industrial Applicability

With reference to the drawings and the previous detailed description, the subject resilient wheels 16,18 with reinforcing rings 20 are particularly useful for increasing the wear life of certain components of a belted undercarriage assembly 14. Specifically, as the resilient idler wheels 16,18 rotate, and the drive belt 12 moves around the wheels 16,18, the guide blocks 28 move into the opening 34 between the wheels 16,18. If the belt is slightly misaligned, the guide blocks 28 frictionally contact the side wall portions 22 or 24. Such frictional contact, over time, can cause damage to the resilient wheels 16,18 and the guide blocks 28. The reinforcing

rings 20 add material to the side wall portions 22,24 and strengthen the resilient wheels 16,18.

Additionally, as the wheels rotate, the first and second straight edge portions 44,46 of the pads 42  
5 wipe mud and debris from the adjacent undercarriage components. The guide rollers 38,40 guide the guide blocks 28 into the opening 34 between the resilient wheels 16,18, as the belt 12 moves around the wheels  
10 between the guide blocks 28 and the side wall portions 22,24 of the wheels 16,18. The wheels 16,18 are reversible so both side wall portions 22,24, with reinforcing ring 20, are utilized to further prolong the useful life of the idler wheels 16,18.

15 Other aspects, objects, and advantages of this invention can be obtained from a study of the drawings, the disclosure, and the appended claims.

Claims

1. Apparatus (10) for supporting and  
guiding an endless elastomeric drive belt (12) of  
5 belted undercarriage assembly (14) said drive belt  
(12) having a guiding portion (26), comprising:

a resilient wheel (16,18) having first and  
second spaced apart side wall portions (22,24), said  
wheel (16,18) being adapted to contact said drive belt  
10 (12), and also being adapted to be mounted to said  
undercarriage assembly (14) adjacent said guiding  
portion (26); and

a plurality of substantially similar spaced  
resilient pads (42) connected to one of said side wall  
15 portions (22,24) of said resilient wheel (16,18), each  
pad (42) being bonded to a side wall portion (22,24)  
of the resilient wheel (16,18).

2. An apparatus (10), as set forth in claim  
20 1, wherein each of said pads (42) has a first edge  
portion (44) which is substantially normal to the side  
wall portion (22,24) to which the pad (42) is bonded.

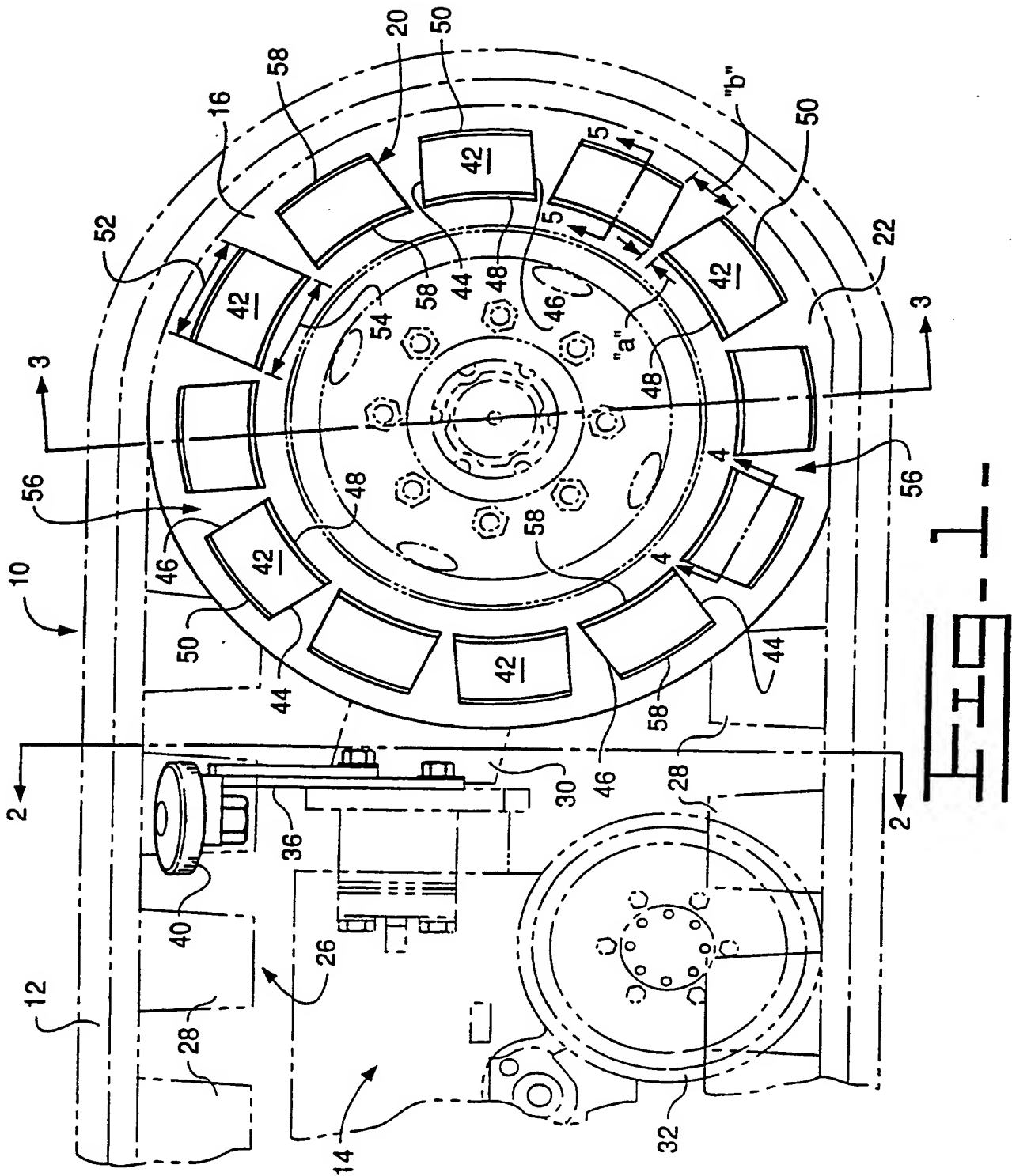
3. An apparatus (10), as set forth in claim  
25 1, wherein each of said pads (42) has an inner edge  
portion (48) having a first arc length (52) and an  
outer edge portion (50) having a second arc length  
(54), said first and second arc lengths (52,54) being  
substantially equal.



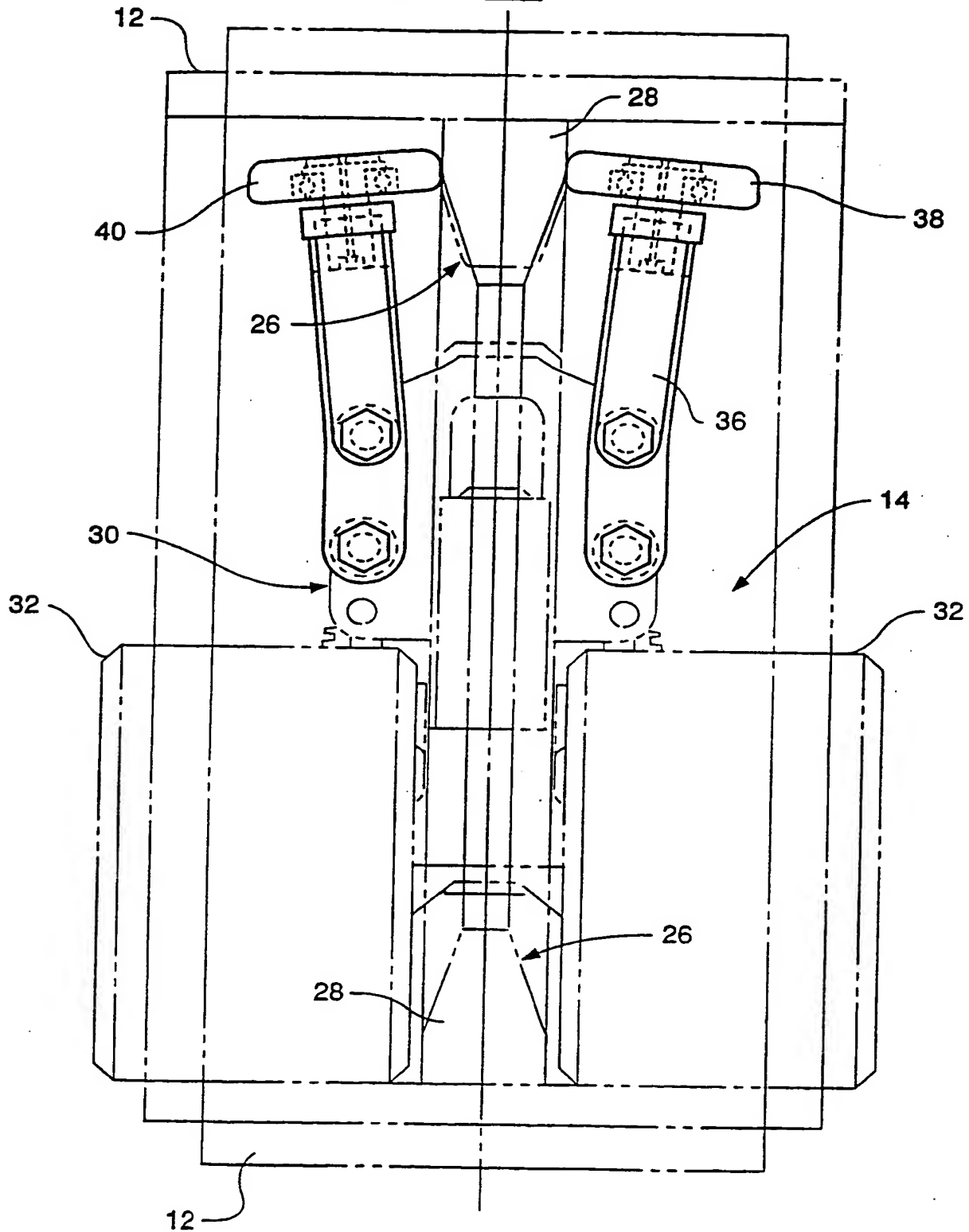
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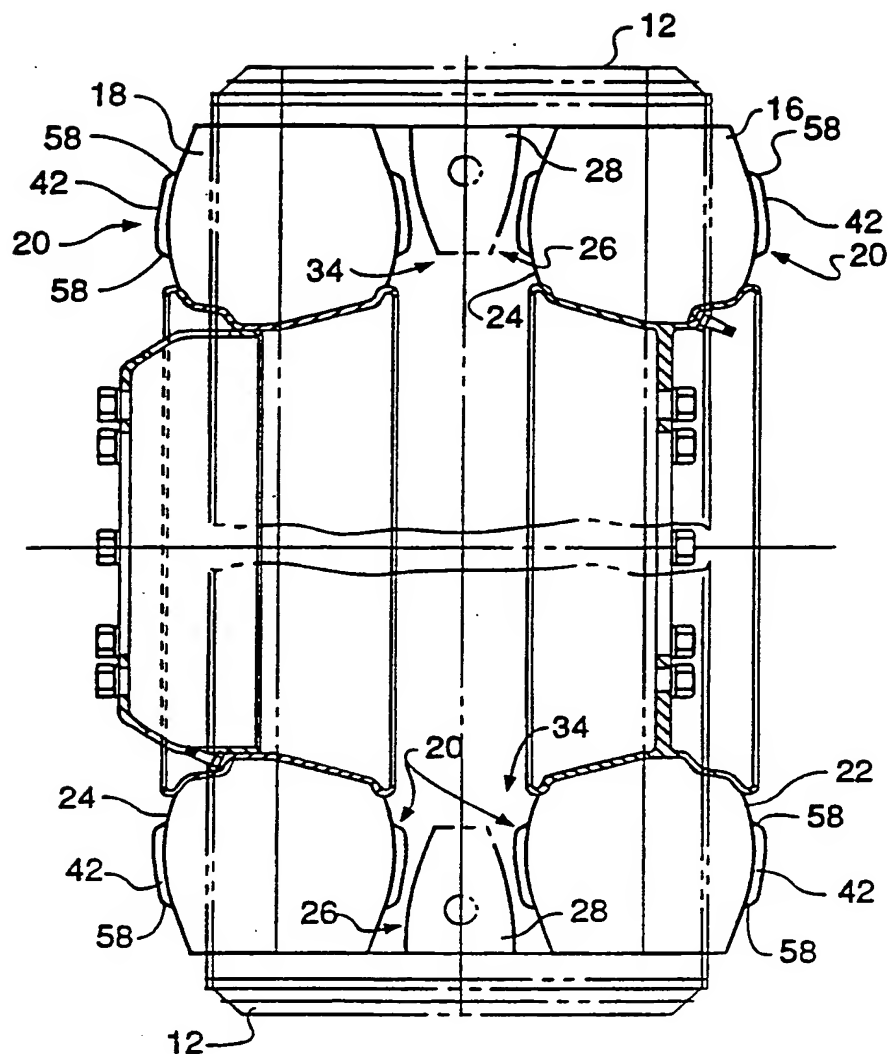
4. An apparatus (10), as set forth in claim 1, wherein adjacent pads (42) define a wedge-shaped space (56) therebetween, said space (56) having an inner dimension ("a") and an outer dimension ("b"),  
5 with the outer dimension ("b") being greater than the inner dimension ("a").

5. An apparatus (10), as set forth in claim 1, including a wheel (16,18) supporting frame  
10 structure (30), first and second spaced apart rotatable guide rollers (38,40) positioned adjacent said guiding portion (26) and said resilient wheel (16,18), and a bracket (36) connected to said frame structure (30), said guide rollers (38,40) being  
15 rotatably connected to said bracket (36) and adapted to contact said belt guiding portion (26).

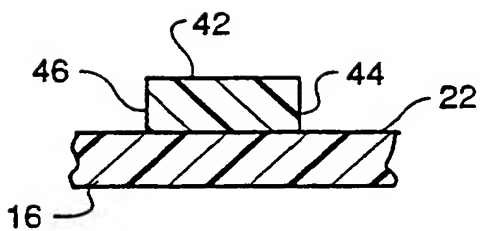


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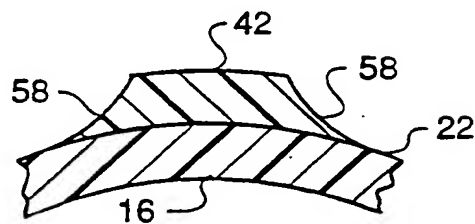
**FIG. 2.**



**FIG. 3.**



**FIG. 4.**



**FIG. 5.**

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US95/03960

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B62D 55/14  
US CL : 305/21

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 305/21  
305/12,13,21,25,28,56,57

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
NONE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 2,059,213 (DORST) 03 November 1936 See Entire Document	NONE
A	US, A 4,607,892 (PAYNE ET AL) 26 August 1986 See Entire Document	NONE
A	CH, A, 206,572 (HURLIMANN) 15 August 1939 See Entire Document	NONE

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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